

WHAT IS CLAIMED IS:

1. A seat belt assembly including an anchor and a seat belt webbing, comprising: an anchor connecting member for connecting the anchor to a vehicle body, a webbing connecting member connected to the seat belt, and a sensor mechanism which detects a force acting between these members, the webbing being inserted into a hole provided in said webbing connecting member, and connected by folding back the same; wherein the portion of the webbing inserted into said hole is folded back from the both sides in the width direction, and the width is reduced by bonding the folded portion with the portion not folded.

2. A seat belt device comprising:

an anchor connecting member configured to be connected to the vehicle body,
a webbing connecting member connected to the seat belt,

a webbing passing through an opening the webbing connecting member,
wherein the webbing located in the opening is folded and constrained from unfolding by stitching extending in a direction transverse to the longitudinal direction of the webbing and

a sensor mechanism which detects a force acting between the anchor connecting member and the webbing connecting member; wherein the sensor mechanism has a shaft bar rotating by relative displacement of said members generated by a force applied between said members; said shaft bar has an arm spring rotating therewith; the arm spring applies, together with rotation of said shaft bar, a pressing force to a sensor plate having a strain gage attached thereto.

3. The device of claim 2, wherein the arm spring is secured to the shaft bar by a screw.

4. The device of claim 3, wherein the arm spring is divided into a fixed portion fixed to said shaft bar and a free end portion other than the fixed portion; the free end

portion is flat; and the fixed portion is folded from the free end portion, and fixed to said shaft bar.

5. The device of claim 4, wherein the shaft bar comprises a substantially square-shaped member; and the free end of said arm spring extends from one side to the other side of said shaft bar along the inner side of the square-shaped portion of said shaft bar, is folded there, and the fixed portion is fixed to a side of the square-shaped portion of said shaft bar.

6. A seat belt device comprising:

- an anchor connecting member connected to the vehicle body,

- a webbing connecting member connected to the seat belt,

- a webbing including one end connected to the webbing by a first stitching to thereby form a looped portion connected to the webbing connecting member; wherein the portion of the webbing adjacent to the looped portion is not folded and wherein the looped portion includes a folded portion and a transition portion that fans out from the folded portion to join the unfolded portion of the seat belt; wherein the first stitching is located in the unfolded portion of the belt and wherein a second stitching is located in the folded portion to constrain the webbing from unfolding; and

- a sensor mechanism arranged to overlay the anchor connecting member and the webbing connecting member, and is configured to detect a force applied between these members; wherein the surface on which said anchor connecting member is connected to the vehicle body and the surface on which said webbing connecting member is connected to the seat belt are in the same plane.

7. The device of claim 6, wherein the distance between the point at which said webbing connecting member transmits the force to said sensor mechanism and the point at which the seat belt is connected to said webbing connecting member is shorter than the distance between the point at which said webbing connecting member transmits the force to said sensor mechanism and the point at which said anchor connecting member is connected to the vehicle body.

8. The device of claim 6, wherein the sensor mechanism comprises (a) a shaft bar which is arranged so as to be rotatably held by said webbing connecting member and works in conjunction with a relative movement between said anchor connecting member and said webbing connecting member resulting from a change in seat belt tension; (b) an arm spring which is attached to said shaft bar, deforms along with rotation of said shaft bar, and transmits a force corresponding to the rotation of said shaft bar to a sensor plate; and (c) a sensor plate which is arranged on said webbing connecting member via a sensor base, deforms by being pushed by said arm spring, and has a strain gage affixed thereto; and said anchor connecting member has a structure in which the portion in engagement with said shaft bar has a ramp with the surface on which said anchor connecting member is fixed to the vehicle body, and runs on said webbing connecting member.

9. The device of claim 6, wherein said sensor mechanism comprises (a) a shaft bar which is arranged so as to be rotatably held by said anchor connecting member, and works in conjunction with a relative movement between said anchor connecting member and said webbing connecting member resulting from a change in seat belt tension; (b) an arm spring which is attached to said shaft bar, deforms along with rotation of said shaft bar, and transmits a force corresponding to the rotation of said shaft bar to a sensor plate; and (c) a sensor plate which is arranged on said anchor connecting member via a sensor base, deforms by being pushed by said arm spring, and has a strain gage affixed thereto; and said webbing connecting member has a structure in which the portion connected to said shaft bar has a ramp with the surface connected to the seat belt, and runs on said anchor connecting member.

10. A seat belt assembly including a belt tension sensor, comprising:
a connecting member for connecting the sensor to a vehicle body,
a carriage of the belt tension sensor, wherein the carriage is adapted to engage a webbing of a seat belt and said carriage is adapted to move relative to a first portion of the seat belt tension sensor in opposition to at least one spring acting between said

first portion of the seat belt tension sensor and said carriage, whereby the amount of movement is responsive to a tension in the seat belt, said carriage comprising:

a. an opening adapted to receive the webbing of the seat belt, wherein said opening cooperates with a corresponding opening in said first portion of the seat belt tension sensor; and

b. a protrusion extending from said carriage, wherein with said carriage is installed in the seat belt tension sensor, said protrusion extends beyond an outer surface bounding said first portion of the seat belt tension sensor and spanning across said opening in said first portion of the seat belt tension sensor; and

wherein the portion of the webbing inserted into the opening is folded back from the both sides in the width direction, and the width is reduced by bonding the folded portion with the portion not folded.

11. The assembly of claim 10, wherein said protrusion comprises at least one flange.

12. The assembly of claim 11, wherein said opening in said carriage is sufficiently narrower than said corresponding opening in said first portion of the seat belt tension sensor so as to prevent said webbing from rubbing against a side of said corresponding opening in said first portion of the seat belt tension sensor responsive to a tension load applied to said webbing.

13. The assembly of claim 10, wherein said protrusion comprises a thimble portion.

14. The assembly of claim 13, wherein said thimble portion comprises a groove, said groove is adapted to receive a portion of said webbing of said seat belt, and said thimble portion and said groove are adapted to prevent said webbing from contacting a side of said opening in said first portion of the seat belt tension sensor responsive to a tension load applied to said webbing.

15. The assembly of claim 13, wherein said thimble portion comprises a groove, said groove is adapted to receive a portion of said webbing of said seat belt, and said

thimble portion and said groove are adapted to prevent said webbing from contacting a surface of said first portion of the seat belt tension sensor responsive to a tension load applied to said webbing.